REMARKS

The present Amendment amends claims 1, 10 and 12, leaves claims 5-9, 11 and 13-21 unchanged, and adds claims 22-24. Therefore, the present application has pending claims 1 and 5-24.

Interview Summary

Applicants thank the Examiner for granting the interview conducted on August 10, 2006. In the interview, arguments were presented to overcome the cited references, particularly Bergenek. The Examiner indicated that Applicants arguments regarding independent claims 1, 10, 12, 13, 17, and 21 appeared to overcome the Bergenek reference. However, the Examiner indicated that further consideration would be required. In this response, Applicants have reiterated the arguments made during the interview.

35 U.S.C. §103 Rejections

Claims 1 and 5-12

Claims 1 and 5-12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,719,200 to Wiebe in view of U.S. Patent No. 5,040,224 to Hara, further in view of Japanese Patent Application Publication No. 06-301768 to Iwata, and even further in view of U.S. Patent No. 6,241,288 to Bergenek, et al. ("Bergenek"). This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claims 1 and 5-12, are not taught or suggested by Wiebe, Hara, Iwata, or Bergenek, whether taken individually or in combination with each other, as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims to more clearly describe features of the present invention. Specifically, the claims were amended to more clearly describe that the present invention is directed to an authentication system and a mobile storage device for authentication as recited, for example, in independent claims 1, 10 and 12.

The present invention, as recited in claim 1 and as similarly recited in claims 10 and 12, provides an authentication system and a mobile storage device for authentication. The authentication system of claim 1 includes a mobile storage device and a reader/writer for performing at least one of reading information from and writing information into the mobile storage device. The reader/writer includes a biological information input device that inputs fingerprint information, a preprocessing means, and a transmitting means for transmitting the core position generated in the preprocessing means to the mobile storage device according to a request from the mobile storage device according to a request from the mobile storage device. The preprocessing means calculates coordinates and curvatures for a plurality of candidate points of the fingerprint information input by the biological information input device, calculates an average value of the coordinates for the plurality of candidate points, and determines a core position by the average value of the coordinates for the plurality of candidate points. The mobile storage device includes a template that registers a plurality of coordinates of featuring points of the fingerprint and partial images in a vicinity of the coordinates, a private key to be used for electronic authentication, a calculating means for calculating information for correcting a positional displacement, a requesting means for calculating coordinates of featuring points of the input fingerprint, a judging means for determining whether the

fingerprint registered in the template and the input fingerprint are identical, and means for making the private key available when the fingerprints are identical. According to the present invention, the requesting means of the mobile storage device repeatedly requests information for specifying each partial image one by one. Furthermore, the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint the partial images requested by the requesting means of the mobile storage device and means for repeatedly transmitting the extracted partial images to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. The judging means of the mobile storage device includes means for repeating the matching result for each partial image. The prior art does not disclose all these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record. More specifically, the features are not taught or suggested by Wiebe, Hara, Iwata, or Bergenek, whether taken individually or in combination with each other.

Wiebe discloses a system for checking the right of access to sensitive information. However, there is no teaching or suggestion in Wiebe of the authentication system or a mobile storage device for authentication, as recited in independent claims 1, 10 and 12 of the present invention.

The Wiebe system checks access rights to sensitive information. The checking is based on current biometric data of a person whose right to access the sensitive information is to be checked. The system includes a data carrier and a processing unit. The data carrier includes a memory containing sensitive

information, a signal processing means and a communication means. The processing unit is adapted to receive the current biometric data from the person and includes a memory, a signal processing means and a communication means. The processing unit preprocesses the current biometric data and transfers the same to the processor of the data carrier via the communication means. The data carrier compares the received preprocessed biometric data with biometric reference data stored in advance in the memory of the data carrier to determine whether the right to access to the sensitive information exists.

One feature of the present invention, as recited in claim 1 and as similarly recited in claims 10 and 12, provides where the requesting means of the mobile storage device repeatedly requests information specifying each partial image one by one. Wiebe does not disclose this feature, and the Examiner does not rely upon Wiebe for teaching the repeated processing of each partial image one by one.

Another feature of the present invention, as recited in claim 1 and as similarly recited in claims 10 and 12, include where the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. Wiebe does not disclose this feature. Furthermore, as conceded by the Examiner, Wiebe does not teach where the transmitting means of the reader/writer includes, for each partial image, a means for repeatedly extracting and transmitting each of the partial images

one by one until a satisfactory level of matching is achieved, as in the present invention.

Therefore, Wiebe fails to teach or suggest "wherein the requesting means of the mobile storage device repeatedly requests information for specifying each partial image one by one" as recited in claim 1, and as similarly recited in claims 10 and 12.

Furthermore, Wiebe ails to teach or suggest "wherein the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved" as recited in claim 1, and as similarly recited in claims 10 and 12.

The above cited deficiencies of Wiebe are not supplied by any of the other references, particularly Hara. Therefore, combining teachings of Hara with Wiebe still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Hara teaches a fingerprint processing system capable of detecting a core of a fingerprint image by statistically processing parameters. However, there is no teaching or suggestion in Hara of the authentication system or a mobile storage device for authentication, as recited in independent claims 1, 10 and 12 of the present invention.

The Hara system detects a core position of a fingerprint image quantized into a plurality of picture elements. Statistical processing is carried out in relation to parameters which are variable in dependency upon the core position and directions

and curvatures of the picture elements preliminarily detected to specify ridges of the

fingerprint image. The parameters may be existence probabilities of the core

position that are determined for the directions and the curvatures. Such existence

probabilities are successively calculated at each picture element and adjacent

picture elements to be summed up and to detect a maximum one of the existence

probabilities. A position that has the maximum existence probability is judged as the

core position. Alternatively, the parameters may be differences between practical

curvatures extracted from the fingerprint image and reference curvatures defining a

reference curve. A minimum one of the differences is statistically detected with

reference to various kinds of reference curves. In addition, the directions and the

curvatures of the picture elements may be determined by deriving the density levels

of the picture elements along a plurality of arcuate lines specified by line directions

and line curvatures.

One feature of the present invention, as recited in claim 1 and as similarly

recited in claims 10 and 12, includes where the requesting means of the mobile

storage device repeatedly requests information for specifying each partial image one

by one. Hara does not disclose this feature, and the Examiner does not rely upon

Hara for teaching the repeated processing of each partial image one by one.

Another feature of the present invention, as recited in claim 1 and as similarly

recited in claims 10 and 12, includes where the transmitting means of the

reader/writer includes, for each partial image, means for extracting from the input

fingerprint a partial image requested by the requesting means of the mobile storage

device, means for transmitting the extracted partial image to the mobile storage

device, and means for repeatedly extracting and transmitting each of the partial

images one by one until a satisfactory level of matching is achieved. Hara does not disclose this feature. Furthermore, as conceded by the Examiner, Hara does not disclose where partial images are extracted and transmitted individually, that is, one partial image is extracted and then transmitted at a time, as in the present invention.

Therefore, Hara fails to teach or suggest "wherein the requesting means of the mobile storage device repeatedly requests information for specifying each partial image one by one" as recited in claim 1, and as similarly recited in claims 10 and 12.

Furthermore, Hara fails to teach or suggestion "wherein the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved" as recited in claim 1, and as similarly recited in claims 10 and 12.

The above noted deficiencies of Wiebe in view of Hara are not supplied by any of the other references, particularly Iwata. Therefore, combining the teachings of Iwata with Wiebe in view of Hara, still fails teach or suggest the features of the present invention, as now more clearly recited in the claims.

Iwata teaches a fingerprint collation device. However, there is no teaching or suggestion in Iwata of the authentication system or a mobile storage device for authentication, as recited in independent claims 1, 10 and 12 of the present invention.

In the Iwata fingerprint collation device, the fingerprint image of the input fingerprint is detected by a fingerprint input means. A pattern direction extraction

means extracts the directions of rising line patterns in the respective parts of the input fingerprint image. A specific point extraction means extracts a specific point provided with the overall features of the rising line patterns in the respective parts of the input fingerprint image. Furthermore, a window image for a positioning deciding means decides a window image for positioning including the specific point. Then, by using the window image for the positioning including the specific point, the window image of the registered fingerprint and the input fingerprint image are positioned by a fingerprint collation means.

One feature of the present invention, as recited in claim 1 and as similarly recited in claims 10 and 12, includes where the requesting means of the mobile storage device repeatedly requests information for specifying each partial image one by one. Iwata does not disclose this feature, and the Examiner does not rely upon Iwata for teaching the repeated processing of each partial image one by one.

Another feature of the present invention, as recited in claim 1 and as similarly recited in claims 10 and 12, includes where the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. Iwata does not disclose this features. Furthermore, as conceded by the Examiner, Iwata does not disclose where partial images are extracted and transmitted individually, that is, one partial image is extracted and then transmitted at a time, as in the present invention.

Therefore, Iwata fails to teach or suggest "wherein the requesting means of the mobile storage device repeatedly requests information for specifying each partial image one by one" as recited in claim 1, and as similarly recited in claims 10 and 12.

Furthermore, Iwata fails to teach or suggestion "where the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved" as recited in claim 1, and as similarly recited in claims 10 and 12.

The above noted deficiencies of Wiebe, Hara and Iwata are not supplied by any of the other references of record, namely Bergenek, whether taken individually or in combination with each other. Therefore, combining the teachings of Wiebe, Hara, Iwata and Bergenek in the manner suggested by the Examiner still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Bergenek teaches a fingerprint identification and verification system. However, there is no teaching or suggestion in Bergenek of the authentication system or a mobile storage device for authentication, as recited in independent claim 1, and as similarly recited in independent claims 10 and 12 of the present invention.

Bergenek's fingerprint identification and verification system uses bitmaps of a stored fingerprint to correlate with a bitmap of an input fingerprint. An accurate reference point is located and selected two-dimensional areas in the vicinity of the reference point of the input image of the fingerprint are correlated with stored

fingerprint recognition information. This correlation is used to determine if the input fingerprint image and the stored fingerprint recognition information are sufficiently similar to identify and verify the input fingerprint.

One feature of the present invention, as recited in claim 1 and as similarly recited in claims 10 and 12, includes where the requesting means of the mobile storage device repeatedly requests information for specifying each partial image one by one. As discussed in the interview with the Examiner, Bergenek does not disclose this feature. In the Office Action, the Examiner relies upon Bergenek to support the assertion that the prior art teaches processing of each partial image one by one. However, Bergenek does not disclose where the *mobile storage device* repeatedly requests information for specifying each partial image one by one, as in the present invention. More specifically, there is no teaching or suggestion in Bergenek of where the smart card, which the Examiner asserts corresponds to the mobile storage device of the present invention, requests information for specifying each partial image one by one, in the manner claimed.

Another feature of the present invention, as recited in claim 1 and as similarly recited in claims 10 and 12, includes where the transmitting means of the reader/writer includes, for each partial image, means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved. As discussed in the interview with the Examiner, Bergenek does not disclose this feature. In the Office Action, the Examiner relies upon Bergenek for teaching processing of each

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partial image one by one. However, Bergenek does not disclose where the transmitting means of the reader/writer includes, for each partial image, means for repeatedly *transmitting* each of the partial images one by one until a satisfactory level of matching is achieved. For example, as described in column 15, lines 14-30, Bergenek merely discloses a matching procedure using the outlying regions. However, there is no teaching or suggestion in the cited text or in any of the other portions of Bergenek, of repeatedly *transmitting* each of the partial images one by one until a satisfactory level of matching is achieved, as in the present invention.

Therefore, Bergenek fails to teach or suggest "wherein the requesting means of the mobile storage device repeatedly requests information for specifying each partial image one by one" as recited in claim 1, and as similarly recited in claims 10 and 12.

Furthermore, Bergenek fails to teach or suggest "wherein the transmitting means of the reader/writer comprises, for each partial image: means for extracting from the input fingerprint a partial image requested by the requesting means of the mobile storage device, means for transmitting the extracted partial image to the mobile storage device, and means for repeatedly extracting and transmitting each of the partial images one by one until a satisfactory level of matching is achieved" as recited in claim 1, and as similarly recited in claims 10 and 12.

Wiebe, Hara, Iwata, and Bergenek each suffer from the same deficiencies relative to the features of the present invention, as recited in the claims. Therefore, combining the teachings of Wiebe, Hara, Iwata, and Bergenek in the manner suggested by the Examiner does not render obvious the features of the present invention, as now more clearly recited in claims 1 and 5-12. Accordingly,

reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection of claims 1 and 5-12 as being unpatentable over Wiebe in view of Hara, further in view of Iwata, and even further in view of Bergenek, are respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references used in the rejection of claims 1 and 5-12.

Claims 13-21

Claims 13-21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,719,200 to Wiebe in view of U.S. Patent No. 6,241,288 to Bergenek, et al. ("Bergenek"). This rejection is traversed for the following reasons. Applicants submit that the features of the present invention, as now more clearly recited in claims 13-21, are not taught or suggested by Wiebe or Bergenek, whether taken individually or in combination with each other, as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims to more clearly describe features of the present invention. Specifically, the claims were amended to more clearly describe that the present invention is directed to an authentication system and a mobile storage device for authentication as recited, for example, in independent claims 13, 17 and 21.

The present invention, as recited in claim 13 and as similarly recited in claims 17 and 21, provides an authentication system including a mobile storage device of a user, and a reader/writer for performing the reading of information from the writing of information into the mobile storage device. The reader/writer includes an interface

for transmitting and relieving information to and from the mobile storage device, and

input device for accepting the input of the biological information of the user, and a

processing unit. The processing unit performs a preprocessing on the biological

information input through the input device, transmits a command for acquiring

information to specify on partial image, extracts one partial image corresponding to

the information coming from the mobile storage device for specifying the one partial

image, from the preprocessed biological information, transmits the extracted one

partial image, to the mobile storage device, and receives the collation result of the

one partial image, from the mobile storage device. The mobile storage device

includes an interface for transmitting and receiving information to and from the

reader/writer, a storage device for storing a partial image of biological information of

the user registered in advance and the information for specifying the partial image,

and a processing unit. The processing unit of the mobile storage device transmits, in

response to the command from the reader/writer, the information for specifying the

one partial image in the storage device, collates, in response to the one partial image

from the reader/writer corresponding to the information for specifying the one partial

image, the one partial image from the reader/writer and the one partial image in the

storage device, and transmits the collation result to the reader/writer. The

processing unit of the reader/writer includes a means for repeatedly transmitting the

command, extracting the one partial image, transmitting the extracted one partial

image, and receiving eh collation result of said one partial image, for each partial

mage, until the matching number of the partial images as a result of the collation

exceeds a predetermined threshold value. Furthermore, the processing unit of the

mobile storage device includes a means for repeatedly transmitting the information

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for specifying the one partial image, collating the partial image, and transmitting the collation result, for each partial image. The prior art does not teach or suggest all of these features.

The above described features of the present invention, as now more clearly recited in the claims, are not taught or suggested by any of the references of record. Specifically, the features are not taught or suggested by either Wiebe or Bergenek, whether taken individually or in combination with each other.

As previously discussed, Wiebe discloses a system for checking the right of access to sensitive information. However, there is no teaching or suggestion in Wiebe of the authentication system or a mobile storage device for authentication, as recited in independent claims 13, 17 and 21 of the present invention.

One feature of the present invention, as recited in claim 13 and as similarly recited in claims 17 and 21, includes where the processing unit of the reader/writer includes means for repeatedly transmitting the command, extracting the one partial image, transmitting the extracted one partial image, and receiving the collation result of the one partial image, for each partial image, until the matching number of the partial images as a result of the collation exceeds a predetermined threshold value. Wiebe does not disclose this feature, and the Examiner does not rely upon Wiebe for teaching the use of partial image template matching.

Another feature of the present invention, as recited in claim 13, and as similarly recited in claims 17 and 21, includes where the processing unit of the mobile storage device includes a means for repeatedly transmitting the information for specifying the one partial image, collating the partial image, and transmitting the collation result, for each partial image. Wiebe does not disclose this feature, and the

Examiner does not rely upon Wiebe for teaching the use of partial image template matching.

Therefore, Wiebe fails to teach or suggest "wherein said processing unit of said reader/writer comprises: means for repeatedly transmitting said command, extracting said one partial image, transmitting said extracted one partial image, and receiving the collation result of said one partial image, for each partial image, until the matching number of said partial images as a result of said collation exceeds a predetermined threshold value" as recited in claim 13, and as similarly recited in claims 17 and 21.

Furthermore, Wiebe fails to teach or suggest "wherein said processing unit of said mobile storage device comprises: means for repeatedly transmitting the information for specifying said one partial image, collating said partial image, and transmitting said collation result, for each partial image" as recited in claim 13, and as similarly recited in claims 17 and 21.

The above noted deficiencies of Wiebe are not supplied by any of the other references of record, namely Bergenek, whether taken individually or in combination with each other. Therefore, combining the teachings of Wiebe and Bergenek in the manner suggested by the Examiner, still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

As previously discussed, Bergenek discloses a fingerprint identification and verification system. However, there is no teaching or suggestion in Bergenek of the authentication system or a mobile storage device for authentication, as recited in independent claims 13, 17 and 21 of the present invention.

One feature of the present invention, as recited in claim 13 and as similarly recited in claims 17 and 21, includes where the processing unit of the reader/writer includes means for repeatedly transmitting the command, extracting the one partial image, transmitting the extracted one partial image, and receiving the collation result of the one partial image, for each partial image, until the matching number of the partial images as a result of the collation exceeds a predetermined threshold value. As discussed in the interview, Bergenek does not disclose this feature. In the Office Action, the Examiner relies upon Bergenek for teaching processing of each partial image one by one. However, Bergenek does not disclose where the transmitting means of the reader/writer includes, for each partial image, means for repeatedly *transmitting* each of the partial images one by one until a satisfactory level of matching is achieved. For example, as described in column 15, lines 14-30, Bergenek merely discloses a matching procedure using the outlying regions. There is no teaching or suggestion in the cited text or in any other portions of Bergenek, of repeatedly transmitting each of the partial images one by one until a satisfactory level of matching is achieved.

Another feature of the present invention, as recited in claim 13, and as similarly recited in claims 17 and 21, includes where the processing unit of the mobile storage device includes a means for repeatedly transmitting the information for specifying the one partial image, collating the partial image, and transmitting the collation result, for each partial image. Bergenek does not disclose this feature. The Examiner asserts that the smart card of Bergenek corresponds to the mobile storage device of the present invention. However, there is no teaching or suggestion in

Bergenek of where the smart card includes means for repeatedly *transmitting* the information for specifying the one partial image, as in the present invention.

Therefore, Bergenek fails to teach or suggest "<u>wherein said processing unit of said reader/writer comprises: means for repeatedly transmitting said command, extracting said one partial image, transmitting said extracted one partial image, and receiving the collation result of said one partial image, for each partial image, until the matching number of said partial images as a result of said collation exceeds a predetermined threshold value</u>" as recited in claim 13, and as similarly recited in claims 17 and 21.

Furthermore, Bergenek fails to teach or suggest "<u>wherein said processing unit of said mobile storage device comprises: means for repeatedly transmitting the information for specifying said one partial image, collating said partial image, and transmitting said collation result, for each partial image</u>" as recited in claim 13, and as similarly recited in claims 17 and 21.

Both Wiebe and Bergenek suffer from the same deficiencies, relative to the features of the present invention, as recited in the claims. Therefore, combining the teachings of Wiebe and Bergenek in the manner suggested by the Examiner does not render obvious the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection of claims 13-21 as being unpatentable over Wiebe in view of Bergenek are respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references used in the rejection of claims 13-21.

New Claims 22-24

Claims 22-24 were added to more clearly describe features of the present invention. Claims 22-24 are dependent on claims 13, 17 and 21, respectively. Therefore, dependent claims 22-24 are allowable for at least the reasons previously discussed regarding independent claims 13, 17 and 21. The features of claims 22-24 are fully supported by the specification, for example, at Fig. 14, step 1117.

In view of the foregoing amendments and remarks, Applicants submit that claims 1 and 5-24 are in condition for allowance. Accordingly, early allowance of claims 1 and 5-24 is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 566.40671X00).

Respectfully submitted,

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